

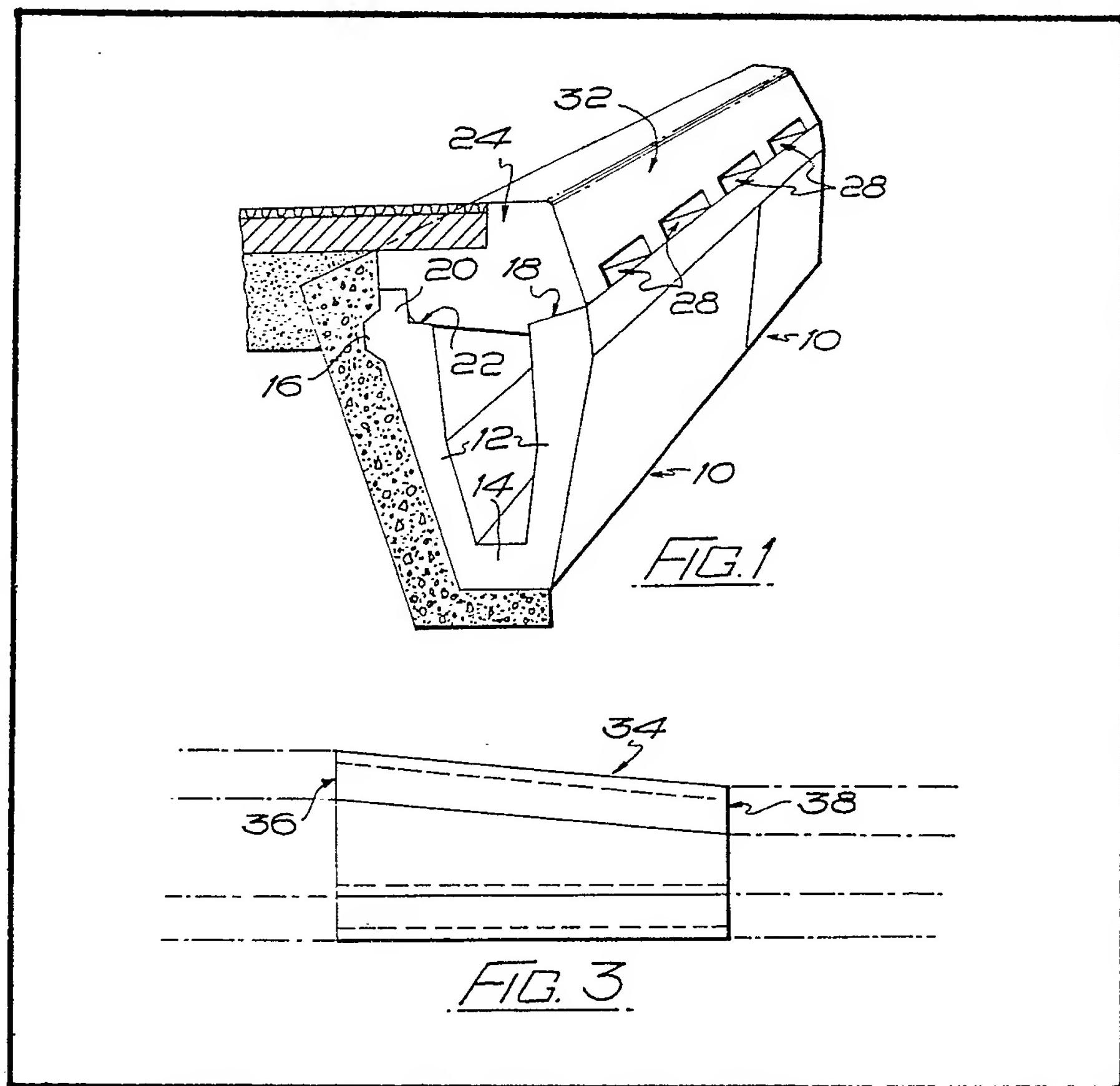
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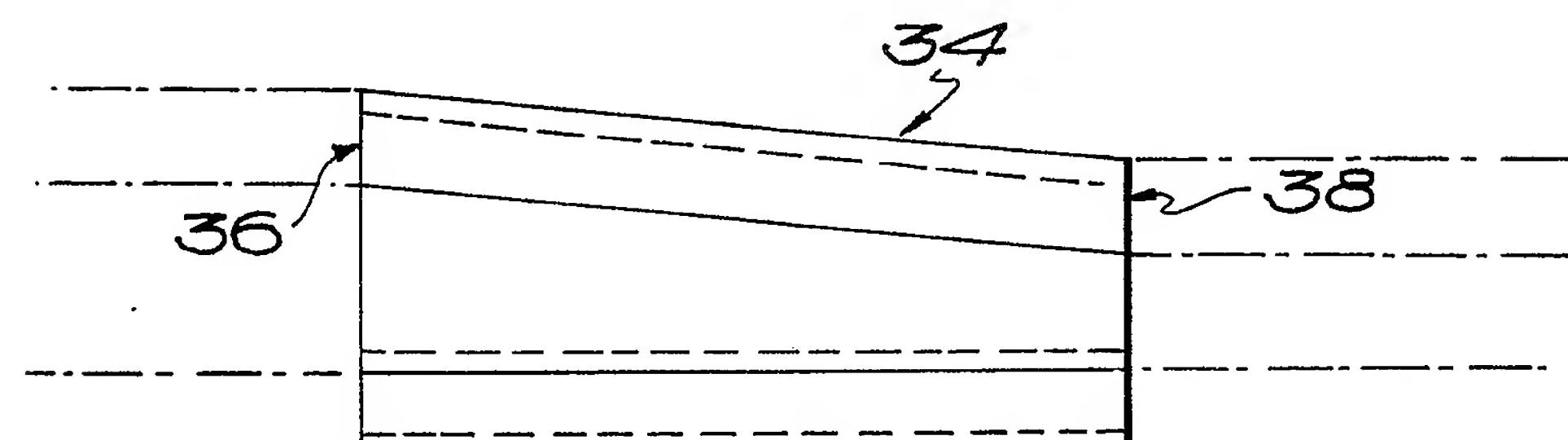
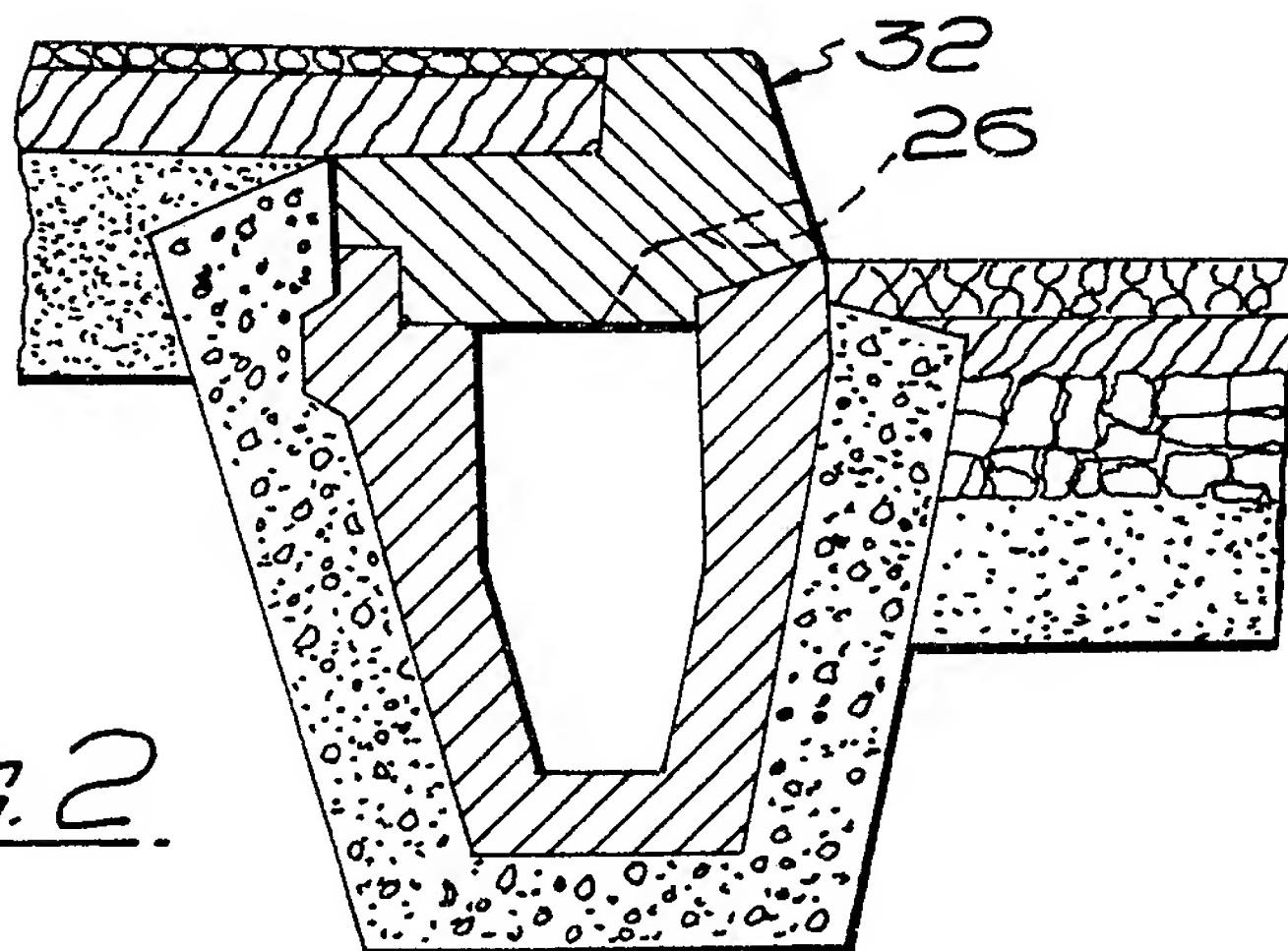
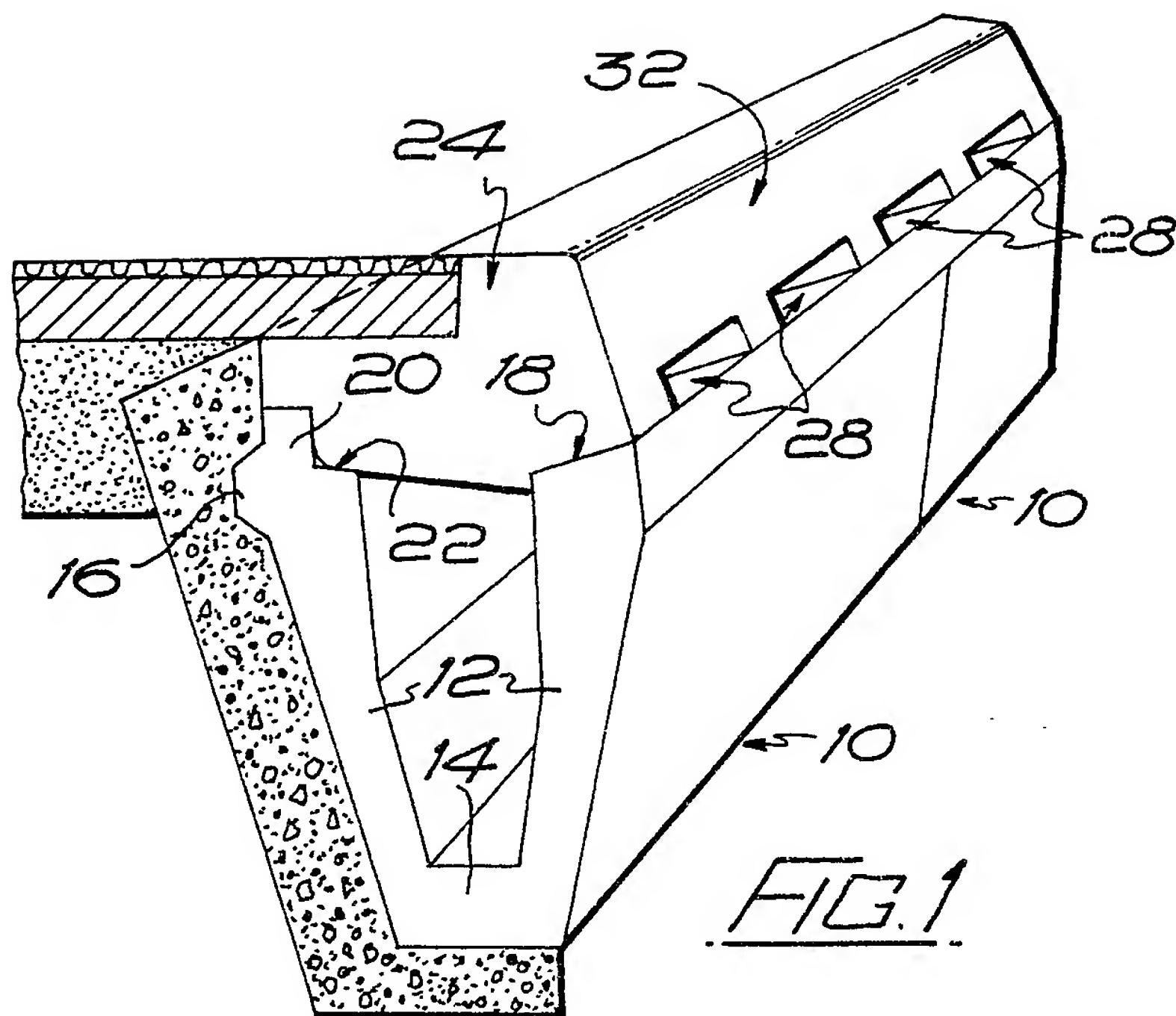
(54) Drainage of highways

(57) In a kerb drain comprising abutting precast concrete channel sections (10) covered by apertured kerb blocks (24) the sections (10) are of different channel sizes along different stretches of road, according to the amount of water expected, and are connected, at a change of size, by a precast tapered-channel section (34) forming a connector unit.

So that the kerb can be straight throughout a continuous run of drainage channel including such a connector unit, the various parts of the tapering flow channel of the connector unit all merge gradually by means of respective planar surfaces extending from one end of the unit to the other, but the vertical side wall (12) which is to be located adjacent the carriageway is arranged in a plane perpendicular to the respective end surfaces (36, 38) of the unit.



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**SPECIFICATION**  
**Drainage of highways**

The invention relates to the drainage of highways.

- 5 It is known to provide a drainage channel formed by a plurality of precast concrete sections laid end to end along a carriageway, their upper edges adjacent the carriageway being level with or slightly below the surface of the carriageway,
- 10 and also including a plurality of cover pieces each of which has at least two longitudinally spaced apart support portions which can be supported on opposite side walls of said channel, the upper surfaces of the cover pieces being disposed in
- 15 stepped relation to the surface which is to be drained to form a kerb. In this known arrangement, each cover piece has intermediate the support portions a cross section such that, when the cover piece is placed in position
- 20 overlying the channel there is formed one or more longitudinal openings above the one edge of the channel adjacent the carriageway through which water may drain from the surface of the carriageway into the channel. The top surfaces of
- 25 the cover pieces may be stepped down a short distance from their edges adjacent the carriageway so that a footpath or grass verge can be laid partly over the cover pieces, level with their side edge portions which form the kerb.
- 30 Such precast concrete sections, which will hereinafter be called precast concrete sections of the kind referred to, are made in several sizes according to the amount of rainwater which they will at times be called upon to carry, the flow
- 35 channels varying in both width and depth. Consequently, it will be understood that, in general, low lying areas will need the larger sizes whereas more elevated areas will require the smaller sizes. However, so that the drainage
- 40 channels can be self-cleansing the precast concrete sections are all of similar cross sectional shape and have flow channels the upper portions of which are parallel sided and the lower portions of which are of trapezoidal section, that is to say
- 45 having inclined side wall portions and relatively narrow flat bottoms.

The object of the invention is to provide a connector unit whereby different sizes of such precast concrete sections can be connected together in a stepless manner.

According to the invention, there is provided a connector unit for connecting together end to end different sizes of precast concrete sections, the connector unit having at its opposite ends respective cross sectional shapes corresponding to those of the precast concrete sections of the kind referred to with which it is to abut, the various parts of the profile of the flow channel all merging gradually by means of respective planar surfaces extending from one end of the unit to the other, but the vertical side wall which is to define one edge of the channel adjacent the carriageway being arranged in a plane perpendicular to the respective end surfaces of

- 65 the unit so that despite changes of size of the precast concrete sections in a continuous run, and the presence of at least one connector unit, the kerb which is formed by the overlying cover pieces can be a perfectly straight line throughout
- 70 the continuous run of drainage channel. A special cover piece will be provided for fitment to the connector unit, the cover piece having support portions matching the varying width of the precast concrete section which it is to overlie.
- 75 In order that the invention may be fully understood and readily carried into effect, the same will now be described, by way of example only, with reference to the accompanying drawings, of which:—
- 80 Fig. 1 is a perspective schematic view of a drainage channel and cover piece therefor, Fig. 2 is a cross sectional view of the channel and cover piece which illustrates their relationship to a carriageway along which the channel has been laid, and
- 85 Fig. 3 is a schematic plan view drawn to a somewhat smaller scale than Figs. 1 and 2.
- 90 Referring now to Figs. 1 and 2 of the drawings, the drainage channel there illustrated is constituted by a plurality of precast concrete sections 10 laid end to end along a carriageway, each section having side walls 12 and a basal wall 14 to form a flow channel an upper portion of
- 95 which is parallel sided and a lower portion of which is of trapezoidal section, that is to say having inclined side wall portions and a relatively narrow flat bottom. The sections are provided with longitudinally extending flanges 16. The upper edge 18 at one side of each section is
- 100 inclined as shown. The opposite edge of each section is provided with an upstanding wall portion 20 which forms a longitudinally extending shoulder 22 within the channel.
- 105 The drainage channel is provided with a plurality of cover pieces 24 (one only being illustrated in Fig. 1, but it will be understood that they can be of any convenient length and that they need not be of the same unit length as the precast sections 10). Each cover piece is of
- 110 stepped form along one side edge so that it can be seated, as shown, on the upstanding wall portions 20 and on the shoulders 22 of the sections 10. In addition, each cover piece has a plurality of longitudinally spaced apart support portions of such a cross section that besides
- 115 being supported along said one side edge on the wall portions 20 and shoulders 22 of the sections 10 it is supported at its other side on the upper edges 18 of the sections 10 as shown.
- 120 Intermediate the support portions, the cover pieces are of a cut-away shape above the upper edges 18 of the sections 10, as shown by the dotted line 26 in Fig. 2, the arrangement being such that, as shown in Fig. 1, there is formed
- 125 above the upper edges 18 of the sections 10 an almost continuous opening 28 through which water may drain from the road surface into the channel.

The cover pieces are of substantial thickness

and strength along their side edges which in use lie adjacent the carriageway, that is to say, through the part immediately above the upper edge 18 of the sections 10 where the greatest stress from vehicle wheels mounting the footpath or grass verge can be expected to be applied. The side surfaces 32 of the cover pieces above the openings 28 are inclined slightly to the vertical, as shown, to act as deflecting surfaces for vehicle wheels which come in contact with them. A short distance from said side surfaces, the top surfaces of the cover pieces are stepped down, as shown, and this is so that a footpath or grass verge can be laid partly over said cover pieces, level with their side edge portions which form the kerb. It will be seen that the width of the remaining, visible when in use, portion of said cover piece is less than half its overall width.

The arrangement is such that when the precast sections 10 have been laid in a mass of concrete filling, as shown, and cover pieces have been positioned on the sections, a road surface can be laid in normal manner and the carriageway surface brought up to the level of the openings 28. If a footpath or grass verge has then been laid so as partly to overlie the cover piece, as shown in Figs. 1 and 2, only a very small part of each cover piece is visible. This is in fact a part which is comparable both in height and width with a standard roadway edging section which is frequently used in places where drainage channels of the kind described and illustrated are not employed. This matching feature is a desirable feature both from an aesthetic point of view and from a practical point of view (since both may from time to time be used along adjoining lengths of carriageway).

As previously mentioned, precast concrete sections of the kind just described are made in several sizes according to the amount of rainwater which they will at times be called upon to carry, the flow channels varying in both width and depth. The larger sizes will generally be used in low lying areas since these can be expected to take the greatest flow of water, that is to say all the water flowing down from higher ground together with that collected locally. As indicated diagrammatically in Fig. 3, where precast concrete sections of one particular size are to be connected to precast concrete sections of another size, a connector unit is required so that the connection can be made in a stepless manner. The connector unit 34 there illustrated has at its opposite ends respective cross sectional shapes corresponding to those of the precast concrete sections of the kind described with reference to Figs. 1 and 2 with which it is to abut. The various

parts of the profile of the flow channel of the connector unit all merge gradually by means of respective planar surfaces extending from one end of the unit to the other. However, it will be observed that despite the narrowing of the flow channel from one end of the connector unit to the other, the vertical side wall which is to define one edge of the channel adjacent the carriageway is arranged in a plane perpendicular to the respective end surfaces 36 and 38 of the unit. In this way, despite changes of size of the precast concrete sections in the continuous run in which the connector unit is disposed, the kerb which is formed by the overlying cover pieces can be a perfectly straight line throughout the continuous run of drainage channel. A special cover piece is of course provided for fitment to the connector unit, the cover piece having support portions matching the varying width of the precast concrete connector unit which it is to overlie.

Thus there is provided a connector unit whereby different sizes of precast concrete sections of the kind referred to can be connected together in a stepless manner. The connector unit can be of any convenient length but it is thought that a 1 metre length will generally be suitable.

#### Claims

- 85 1. A connector unit for connecting together end to end different sizes of precast concrete sections, the connector unit having at its opposite ends respective cross sectional shapes corresponding to those of the precast concrete sections of the kind referred to with which it is to abut, the various parts of the profile of the flow channel all merging gradually by means of respective planar surfaces extending from one end of the unit to the other, but the vertical side wall which is to define one edge of the channel adjacent the carriageway being arranged in a plane perpendicular to the respective end surfaces of the unit so that despite changes of size of the precast concrete sections in a continuous run, and the presence of at least one connector unit, the kerb which is formed by overlying cover pieces can be a perfectly straight line throughout the continuous run of drainage channel.
- 90 2. A connector unit according to claim 1, in which a special cover piece is provided for fitment to the connector unit, the cover piece having support portions matching the varying width of the precast concrete section which it is to overlie.
- 95 3. A connector unit constructed, arranged and adapted to be used substantially as hereinbefore described with reference to and as illustrated by the accompanying drawings.

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**ABSTRACT:**

In a kerb drain comprising abutting precast concrete channel sections (10) covered by

apertured kerb blocks (24) the sections (10) are of different channel sizes along different stretches of road, according to the amount of water expected, and are connected, at a change of size, by a precast tapered-channel section (34) forming a connector unit.

So that the kerb can be straight throughout a continuous run of drainage channel including such a connector unit, the various parts of the tapering flow channel of the connector unit all merge gradually by means of respective planar surfaces extending from one end of the unit to the other, but the vertical side wall (12) which is to be located adjacent the carriageway is arranged in a plane perpendicular to the respective end surfaces (36, 38) of the unit. □